



THE
**ONTARIO WATER RESOURCES
COMMISSION**

REPORT ON

WATER POLLUTION SURVEY
OF
COBOURG BROOK
WITH PERTINENT
MUNICIPAL SANITARY SURVEY REPORTS

ON

TOWN OF COBOURG
TOWNSHIP OF HAMILTON

MOE
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WAT
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JUNE 14th, 15th, 16th, and 27th,

1961

REVIEW OF INITIAL SURVEYS CONDUCTED IN 1959

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RESOURCES COMMISSION

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OF
COBOURG BROOK
WITH PERTINENT
MUNICIPAL SANITARY SURVEY REPORTS
ON
TOWN OF COBOURG
TOWNSHIP OF HAMILTON
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Date
June 14th, 15th, 16th, and 27th,
1961

(REVIEW OF INITIAL SURVEYS CONDUCTED IN 1959)

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COUNTY OF NORTHUMBERLAND

WATER POLLUTION SURVEY OF COBOURG BROOK

INTRODUCTION

Investigations were conducted during the period of June 14th to 16th, and on June 27th, 1961, to determine the extent of present pollution in the waters of Cobourg Brook, and to ascertain if adequate remedial measures have been taken to reduce or eliminate the pollution revealed in this watercourse during a previous survey conducted during the period of March 4th to April 14th, 1959. Similarly, enquiries and investigations were made to review conditions which were revealed by the municipal sanitary survey of the Town of Cobourg conducted in conjunction with the initial survey of Cobourg Brook.

A sampling program was conducted, with samples being collected from private, municipal and industrial outfalls, as well as from the waters of Cobourg Brook, an improved watercourse which flows through the town, and Brook Creek. These three watercourses flow, in part, through Cobourg and receive discharges from the municipality. For the purposes of this report, this improved watercourse has been designated as the Town Watercourse. Brief reports on these latter creeks are included herein.

GENERAL

Interviews were held with the following officials during this survey:

Mr. J.B. Ewart, Town Clerk, Cobourg,
Mr. C.B. Saunders, Town Engineer, Cobourg,
Mr. J. D. Finlayson, C.S.I.(C), Chief Sanitary Inspector, Northumberland-Durham Health Unit.

A report on the municipal sanitary survey of the Town of Cobourg is appended to this report on Cobourg Brook.

In conjunction with the aforementioned initial surveys conducted in 1959, municipal sanitary surveys of the Police Village of Bewdley and the Township of Hamilton were made. These surveys were not repeated, in full, during the recent investigations.

No evidence had been revealed during the initial surveys to indicate that discharges from Bewdley gain access to the nearby waters of Rice Lake.

A resume of progress made in abating pollution with respect to the Township of Hamilton is appended to this report. Samples were collected from the waters of Brook Creek at its mouth during these recent investigations. The sampling of Cobourg Brook within the Township of Hamilton is described in the "Report on Water Pollution Survey of Cobourg Brook".

COBOURG BROOK WATERSHED

As described in the initial report, this funnel-shaped watershed covers an estimated 30,336 acres, and tapers to the mouth of the creek at Cobourg on the shore of Lake Ontario. The watershed includes parts of the Town of Cobourg and the Township of Hamilton, with a

fringe area lying in the Township of Haldimand. Several branches of the creek converge in its upper reaches to form the main stream. A branch flowing from the Camborne area joins the main watercourse in the northwestern part of Cobourg.

Cobourg Brook flows for the most part in a gravel bed with numerous small rapids, and in some sections pursues a tortuous course.

WATER USES

Use of the creek waters for purposes other than agriculture and recreation is confined mainly to the downstream section in Cobourg. Within this municipality the watercourse receives discharges from municipal, industrial and private sources.

SAMPLING PROCEDURE

The locations of stream sampling points are shown on the appended watershed map. "Grab" samples were collected, forty (40) ounce samples for sanitary chemical analysis, and six (6) ounce samples for bacteriological examination. In some instances, additional samples were collected for specific chemical analyses. Laboratory tests were performed at the Ontario Water Resources Commission Laboratory, Toronto.

SAMPLING CONDITIONS

The occurrence of a heavy rainfall during the late afternoon of June 13th, and the associated discharging of surface run-off flows to the creek, resulted in increased

flows in Cobourg Brook when samples were collected therefrom on June 14th, 1961. Severe turbid conditions were visibly evident in the watercourse at this time.

Seasonal stream conditions were evident when additional samples were collected on June 27th, 1961.

SAMPLING RESULTS

The laboratory results of analyses and examinations performed on the samples collected are shown in appendices to this report as follows:

TABLE I	COBOURG BROOK
TABLE II	MUNICIPAL OUTFALLS
TABLE III	INDUSTRIAL OUTFALLS
TABLE IV	PRIVATE OUTFALLS

Maps of Cobourg Brook Watershed and the various municipalities concerned are appended to this report.

The laboratory analyses and examinations performed on samples collected from the waters of Cobourg Brook reveal a significant area of pollution in the downstream section of the watercourse within the Town of Cobourg. The high coliform content revealed in the creek water downstream from the Cobourg sewage treatment plant outfall, the trunk sewer overflow and the private sewer discharge at University Avenue, may be attributed to the effects of these outfalls on the bacterial quality of the watercourse. The phenol content in the creek near its mouth was somewhat excessive, and may have resulted from the discharging of

phenols thereto from the General Wire and Cable plant and the municipal sewage treatment plant outfall. Traces of chromium were evident in the watercourse near its mouth, probably resulting from the presence of tannery waste in the sewage treatment plant effluent.

Upstream from Cobourg, satisfactory conditions were indicated in Cobourg Brook. The high coliform content revealed on June 14th sampling point #CBB.5.6 downstream from Baltimore is attributed to run-off from grazing lands, since the subsequent sampling of the watercourse at this location on June 27th indicated satisfactory conditions.

MUNICIPAL SANITARY SURVEY

of the

TOWN OF COBOURG

June 14th, to 16th, and 27th, 1961

INTRODUCTION

This report is supplementary to the original Sanitary Survey Report on the Town of Cobourg which was prepared during 1959, subsequent to investigations conducted there by Commission staff. The recent investigations conducted there during the period of June 14th to 16th, and on 27th, 1961, were undertaken in order to review the original findings, and again pertain to conditions within Cobourg which affect Cobourg Brook, the Town Watercourse, part of Brook Creek, and Lake Ontario.

Appended is a map of Cobourg showing the sampling points within this municipality. Tables #2,3, and 4 show the results of outfall samples collected at Cobourg.

MUNICIPAL SERVICES

During the two years which have elapsed since the initial survey conducted at Cobourg by this Commission, the assessed population has increased by more than 500. The town is serviced by municipal water works, and separate sanitary and storm sewers. A program of storm sewer construction presently is being undertaken.

The municipal water supply is drawn from Lake Ontario. Filtration and chlorination treatments are provided at the water purification plant. Chlorine dioxide treatment has been employed occasionally to combat phenolic tastes.

A biofiltration type of sewage treatment plant is employed. The plant effluent discharges to Cobourg Brook approximately 1/2 mile upstream from its mouth at Lake Ontario.

Networks of municipal storm sewers terminate at Cobourg Brook, the Town Watercourse, Brook Creek, and Lake Ontario.

WATERCOURSES PERTINENT TO THE TOWN OF COBOURG

In addition to Cobourg Brook, the Town Watercourse and Brook Creek are of some importance with respect to outfalls in Cobourg. The Town Watercourse has its source in Hamilton Township but flows for the most part through the town to empty into the lake. A branch of Brook Creek flows, in part, through Cobourg.

The Town Watercourse flows in a southerly direction through the central part of Cobourg and empties into the harbour, as shown on the appended map of the town. This watercourse has been improved, and south of Covert Street has been tiled. This tiled section extends beneath the commercial area of Cobourg.

Some years ago a 12 inch sewer, known locally as the "tannery sewer", was laid below the bed of the Town Watercourse to conduct wastes from the tannery in north-central Cobourg to Lake Ontario. This sewer was abandoned by the tannery when municipal sanitary sewers were provided, and has been connected to the municipal sanitary sewer system at Albert Street. Reportedly, wastes from various premises still are discharged to the tannery sewer.

The Town Watercourse receives process waters from the Canadian General Electric Company Limited plant, and numerous storm sewer discharges including flows from a municipal storm sewer on King Street. This King Street storm sewer receives also sanitary wastes from premises which do not have sanitary sewer connections.

Brook Creek is a natural drainage course composed of two branches which have their source in a rural area and converge at the eastern limits of Cobourg. The combined flows pursue a southerly course to empty into Lake Ontario, within the Township of Hamilton, immediately east of Cobourg.

The western branch of this watercourse receives natural drainage flows from the town, as well as storm water flows from the 26 Central Ordnance Depot and a municipal storm sewer which extends southerly along Darcy Street and discharges to the Ordnance Depot storm sewer.

A proposed town storm sewer on Cottesmore Avenue reportedly will discharge to Brook Creek.

Storm drainage flows enter Brook Creek at Highway #2 within the Township of Hamilton.

WATER WORKS

Water is drawn from Lake Ontario, disinfected by chlorine or chlorine dioxide treatment, treated with alum for coagulation, and pumped through pressure filters to the distribution system. The chlorine dioxide treatment is employed occasionally to control tastes in the water.

From the water purification plant at the foot of Darcy Street, the 25 inch diameter intake pipe extends 900 feet into the lake, terminating in approximately 20 feet of water. Two 12 inch diameter mains connect the plant to the distribution system. The elevated storage tank is located east of Ontario Street in west-central Cobourg and has a capacity of 0.3 million gallons. The average daily water use is 1.0 to 1.5 million gallons, but varies according to seasonal requirements. All services are metered.

An inspection of the Cobourg water works was made by the Commission staff on January 10th, 1961, revealing generally satisfactory conditions. Some recommendations were made with respect to operational procedures.

A sample of raw water was taken from the intake well at the water works on June 15th, 1961. The results of sanitary chemical analysis and bacteriological examination

are reported as follows:

LOCATION OF SAMPLE	LAB. NO.	5-DAY B.O.D. (PPM)	PHENOL IN PPB.	SOLIDS TOTAL SUSP. DISS. (PPM)	MF COLIFORM COUNT PER 100 ML
UNTREATED WATER 4878 AT COBOURG W.W.	3.2	3.	202	8 194	30

The Town of Cobourg water works system is operated by the local Public Utilities Commission.

SEWAGE WORKS

As recorded in the initial survey report, the Cobourg sewage treatment plant is located near the west bank of Cobourg Brook in the western part of the municipality. Sanitary sewage and industrial wastes are discharged to the sanitary sewer system and either flow by gravity or are pumped to the sewage treatment plant. Three sewage pumping stations are employed. The locations and emergency overflow arrangements at these sewage pumping stations are as follows:

<u>Location</u>	<u>Overflow</u>
1. Near corner of Tweed Street and Fourth Street.	- through upstream manhole to Cobourg Brook
2. On Albert Street near First Street.	- To municipal storm sewer on Division Street and thence to harbour
3. At the Shopping Centre	- no overflow

Weir arrangements are employed at several locations in the municipal sanitary sewer system to permit the emergency discharge of sewage to municipal storm sewers and thence to the lake. These overflows normally could result

from: storm sewers connected to the sanitary sewer system; ground waters infiltrating into the sanitary sewers; storm water on private premises being discharged to the sanitary sewer system.

During this latter survey, unsatisfactory weir arrangements were observed at the following locations:

At the corner of Albert Street and Third Street, sewage flows were escaping around the ends of the weir and discharging through the storm sewer on Third Street to the harbour. The following laboratory results reveal the sanitary chemical and bacteriological quality of these flows on June 15th:

<u>Location of Lab.</u>	<u>5-Day B.O.D.</u>	<u>Solids (ppm)</u>	<u>MF Coliform</u>		
<u>Sample</u>	<u>Sample No.</u>	<u>(ppm)</u>	<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>
Manhole at corner of Albert St. and Third St.	4868	210	1500	310	1190
					17,000,000

At the corner of Albert Street and Division Street, sewage flows similarly were escaping around the weir and discharging into the storm sewer on Division Street which terminates at the harbour. The following laboratory results reveal the sanitary chemical and bacteriological quality of these flows escaping through the storm sewer on June 15th:

<u>Location of Lab.</u>	<u>5-Day B.O.D.</u>	<u>Solids (ppm)</u>	<u>MF Coliform</u>		
<u>Sample</u>	<u>Sample No.</u>	<u>(ppm)</u>	<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>
Manhole at corner of Albert St. & Division St.	4869	115	618	126	492
					41,100,000

The foregoing observations indicate the necessity for providing frequent local inspection and maintenance of these

weirs.

An additional weir arrangement is provided in the municipal trunk sanitary sewer extending along University Avenue to the sewage treatment plant, being located at the east end of the University Avenue bridge. This weir was constructed to divert a portion of sewage flows to the creek during periods of heavy sewage flows. Although the design capacity of the sewage treatment plant reportedly approximates 2.0 million gallons per day, heavy flows of sewage escape over this **weir** during periods when the flows entering the plant are indicated to be as low as 1.2 million gallons. Mr. Saunders, Town Engineer, has reported that the **crest** of this **weir** will be raised to prevent the unnecessary diversion of sewage flows to the watercourse at this location.

Consideration presently is being given to the construction of a relief sanitary sewer on Division Street. The town has sought approval for the construction of such a sewer along James Street from College Street, south on John Street to Chapel Street, west on Chapel Street to Division Street, and south on Division Street to the lake-shore where a pumping station would deliver these sewage flows to harbour. The inadequate capacity of the existing Division Street sanitary sewer, with the resulting occasional occurrence of sewage backing therefrom into basements, has instigated the proposal to construct this relief sewer.

The Cobourg sewage treatment plant is of the high-rate bio-filter type. The design capacity of this sewage treatment plant reportedly is 2.0 million gallons per day. During an inspection of this plant late in 1960 by Mr. P.G. Cockburn, P. Eng., Assistant District Engineer with this Commission, it was calculated that the capacity of the plant for providing effective secondary treatment would not exceed 1.5 million Imperial gallons per day at this time. The rate of influent sewage flows at the plant during this latter survey were indicated to vary from 1.2 to 1.3 million Imperial gallons per day. Overflows were occurring at the weir in the influent sewer at all times of observation. A bypass arrangement at the plant permits emergency and excessive flows to discharge through the plant outfall to Cobourg Brook.

A chlorinator is employed to apply chlorine to flows in the recirculation pump well prior to the primary clarifier, and to flows entering the bio-filter. Effluent chlorination is not practised at this plant.

During all visits to this sewage treatment plant by Commission staff, problems have been reported with respect to the presence of industrial wastes in the plant influent. Apparently, the town has not exercised the authority vested in its sewer ordinance for controlling the quality of wastes discharged to the municipal sanitary sewer system.

The following results were obtained from three sets of samples which were submitted to the Ontario Water Resources Commission laboratory by the operator of the Cobourg sewage treatment plant. The descriptions of the sampling points are as noted below:

1. Raw sewage influent
2. Influent to bio-filter
3. Final effluent
4. Creek 100 yards upstream from plant outfall
5. Creek 100 yards downstream (or at King Street)

DATE SAMPLED 1961	SAMPLE	DAY B.O.D. (PPM)	SOLIDS (PPM)			pH	CHROME AS CR	TURBIDITY (SILICA UNITS)	MF COLIFORM COUNT/100 ML
			TOTAL	SUSP.	DISS.				
JUNE 5	1	210.	1828	544	1284	8.5	17.5	---	22,000,000
	2	18.	682	62	620	7.6	0.16	---	390,000
	3	16.	692	66	626	7.6	0.5	---	340,000
	4	2.2	242	--	---	8.1	0.0	2	1,000
	5	3.2	238	--	---	8.2	0.0	2	1,370
JUNE 12	1	500.	2074	940	1134	11.5	10.	---	0
	2	9.	572	38	534	7.8	0.22	---	450
	3	2.4	584	46	538	7.7	0.26	---	600
	4	1.6	268	--	---	8.3	0.06	3	170
	5	4.0	254	--	---	8.4	0.06	2	230
JUNE 19	1	220.	2050	890	1160	8.8	18.0	---	2,750,000
	2	16.	590	26	564	7.5	0.33	---	139,000
	3	13.	592	40	552	7.6	0.25	---	134,000
	4	1.4	270	--	---	8.3	0.11	2	118
	5	2.4	272	--	---	8.3	0.11	2	400

The following laboratory results were obtained from two sets of samples pertinent to the sewage treatment plant which were collected by Commission staff during this survey:

DATE OF SAMPLE 1961	SAMPLE NO.	5-DAY B.O.D. (PPM)	SOLIDS (PPM)			PH	CHROME AS CR	PHENOL IN (PPB)	MF COLIFORM COUNT PER 100 ML
			TOTAL	SUSP.	DISS.				
JUNE 14 10:00 AM (HEAVY PRE- CIPITATION ON PREVIOUS DAY)	1	190.	2176	838	1338	10.8	14.	---	BROKEN IN TRANSIT
	2	14.	816	48	768	7.4	0.8	---	23,300
	3	8.	758	16	742	7.9	0.6	4	62,000
	4	1.4	308	54	254	8.4	0.0	2	1,600
	5	3.4	326	22	304	7.9	0.37	---	260,000
JUNE 27 7:30 PM	1	240.	1872	614	1258	9.0	5.83	300	5,700,000
	2	38.	954	60	894	8.3	1.33	70	3,900,000
	3	59.	1054	158	896	8.5	2.30	60	590,000
	4	1.9	260	14	246	8.4	0.07	2	54
MOUTH OF CREEK		5.1	332	34	298	8.4	0.16	7	8,900

Although a high 5-day B.O.D., suspended solids and coliform content are revealed in the sewage treatment plant effluent, it is probable that the adverse results obtained from creek samples collected downstream from the sewage treatment plant might have resulted not only from the plant discharges but also from the trunk sanitary sewer overflow and a private sewer discharge at University Avenue. The results of samples collected by Commission staff on June 14 and 27, indicate that the excessive coliform contents in the sewage treatment plant effluent were contributing to the excessive coliform contents revealed in the watercourse downstream. The presence of a high chromium and phenol content in the creek near its mouth is attributed to the presence of these wastes in the sewage treatment plant effluent and the trunk sewer overflow at University Avenue. Phenol was present also in the process water discharge from the General Wire and Cable plant.

PRIVATE SEWER OUTFALLS

Some sections of Cobourg remain unserved by sanitary sewers. In such cases, sanitary and domestic wastes are discharged either directly to watercourses, to municipal storm sewers, or to private septic tank systems. Officials of the Northumberland-Durham Health Unit staff are vigilant in their supervision of inadequate sewage disposal facilities on premises where municipal sanitary sewers are not available.

The laboratory results of samples collected from private outfalls are shown in Table IV which is appended to this report.

Sampling point # CB.0.5P is located where a private sewer terminates on the east bank of Cobourg Brook a few yards north of University Avenue, and reportedly serves a garage and house on the east side of William Street, three houses on the west side of William Street, and three houses on the north side of University Avenue near the creek. Untreated or inadequately treated sanitary wastes emanate from this sewer outlet. Health unit and municipal officials have discussed the feasibility of providing municipal sanitary sewer services for these premises by constructing a sewer from Margaret Street under University Avenue to the unserved area.

Unsatisfactory private sewage disposal facilities at the General Wire and Cable Limited plant are discussed in this report under the section entitled "Industrial Outfalls".

A private sewer which formerly served the Home for the Aged in northwestern Cobourg has its outlet on the west bank of the Coldsprings Branch of Cobourg Brook at Elgin Street (Sampling point #CBC.1.6P). Although the institutional connection has been severed in favour of a municipal sanitary sewer connection, one residence continues to discharge sanitary wastes through this sewer to the watercourse. The health unit staff have reported that this remaining connection soon will be severed.

In the absence of sanitary sewer connections, commercial premises on King Street west of Division Street discharge sewage flows to the storm sewer on King Street which has its outfall to the Town Watercourse.

The initial survey in 1959 disclosed that a house on Station Street discharged sewage flows to the Town Watercourse. Subsequently, this residence has been provided with a connection to the sanitary sewer on George Street. The action of the health unit staff was responsible for accelerating the correction of this condition.

A private storm sewer from the 26 Central Ordnance Depot terminates on the bank of Brook Creek and conducts drainage from area catch-basins, rain-water leaders, drinking fountains, and waters exhausted from the air-conditioning system at this Department of National Defence base. A municipal storm sewer extending south along Darcy Street is connected to the Depot sewer. The following sample results indicate the characteristics of these flows which combine and discharge to Brook Creek:

LOCATION OF SAMPLE	DATE 1961	5-DAY B.O.D. (PPM)	SOLIDS (PPM) TOTAL SUSP.DISS.			TURBIDITY (SILICA UNITS)	MF COLIFORM COUNT/100 ML
ORDNANCE DEPOT STORM SEWER OUTFALL TO BROOK	JUNE 15	1.2	542	--	--	1	7,000
	JUNE 27	1.1	508	2	506	--	5,500
MANHOLE IN DEPOT SEWER UPSTREAM FROM MUNICIPAL CONNECTION	JUNE 27	1.1	448	22	426	--	2,600

STORM SEWERS

Networks of municipal storm sewers terminate at Cobourg Brook, the Town Watercourse, Brook Creek, and Lake Ontario.

The presence of contaminants in municipal storm sewer outfalls, as revealed during this survey, was confined to locations where weir arrangements permitted sanitary sewage to escape into storm sewers which discharge to the harbour. As described in the section entitled "Sewage Works", these malfunctioning weirs should be repaired.

The present program of storm sewer construction in Cobourg was outlined by Mr. C. B. Saunders, Town Engineer. By referring to the appended map of Cobourg it may be seen that new systems of storm sewers have been constructed in western sections of Cobourg and drain to Cobourg Brook. Storm sewers will be laid soon in eastern and southeastern Cobourg. A proposed storm sewer on Cottesmore Avenue will drain to Brook Creek north of Highway #2.

INDUSTRIAL OUTFALLS

Wastes from three industrial premises in Cobourg discharge to watercourses. These firms are: General Wire and Cable Limited, Stuart's Dairy, and Canadian General Electric Company Limited. Investigations of industrial waste disposal procedures at these plants were made recently by Mr. G. Cousins, P. Eng., of the Industrial Waste Branch of this Commission, and reference could be made to the reports on these investigations.

Although industrial wastes had been discharged formerly from the General Foods Limited plant to Cobourg Brook, this condition reportedly has been corrected.

Reports have been prepared in connection with sanitary waste disposal procedures at the General Wire and Cable Limited plant and the Canadian General Electric Company Limited plant. Similarly, a report on industrial waste disposal procedures at Stuart's Dairy has been prepared. The laboratory results of samples pertinent to outfalls from industrial premises are shown in Table III.

General Wire and Cable Limited discharges process waters and untreated sanitary wastes through the plant outfall to Cobourg Brook. The following laboratory results were obtained from samples which were collected from the plant outfall during this survey:

Date of Sample 1960	5-Day B.O.D. (ppm)	Solids (ppm)			pH	Phenol ppb.	MF Count/100 ML
		Total	Susp.	Diss.			
June 15	135.	364	28	336	-	6.	2,780,000
June 27	1.6	258	24	234	-	0	126,000

The excessive coliform content revealed in this outfall on June 15th prompted the re-inspection on June 27th, at which time a plant official suggested that sanitary fixtures in the basement of this factory might discharge through the outlet to the creek. Faecal matter was visibly evident in the plant discharge.

During recent excavating procedures on these premises,

the clay tile piping extending from the septic tank to the tile bed was disturbed, and subsequently the partially treated sewage flows have been permitted to discharge to Cobourg Brook. The following sample results reveal the unsatisfactory quality of this discharge:

Date of Sample 1961	5-Day B.O.D. (ppm)	Solids (ppm)	MF Coliform Count/100 ML
		Total Susp. Diss.	
June 15	7.0	758 162 596	23,000

An extension from the municipal sanitary sewer system terminates at a manhole near the General Wire and Cable Limited building. Officials of this firm have given assurance that, upon completion of the new plant extension, all sanitary wastes will be collected and discharged to the municipal sewer.

Stuart's Dairy is located near the Coldsprings Branch of Cobourg Brook in the northern part of the town. During the initial survey in 1959, and upon another subsequent occasion the owner of this dairy agreed to investigate methods of excluding the dairy waste from the creek. It was evident on June 15th, 1961, that no such action has been taken, as is evident from the following laboratory results of samples collected from the plant outfall:

5-Day B.O.D. (ppm)	Solids (ppm)	MF Coliform Count per 100 ML
	Total Susp. Diss.	
190.	624 156 468	8,000

This dairy is located quite distant from any proposed or existing part of the municipal sanitary sewer system.

It is obvious that a private method of disposal will be necessary. Spray irrigation has been suggested to Mr. Stuart as a practical method of disposal.

The Canadian General Electric Company Limited plant is located in the northern part of the municipality. Process waters are discharged through a concrete tile sewer to the Town Watercourse. Sanitary wastes are discharged to the municipal sanitary sewer system.

The laboratory results of samples taken from this process water outfall during the initial survey and the latter survey have revealed higher coliform contents than normally would be anticipated in a process water discharge. The following laboratory results of samples taken therefrom illustrate the high coliform content of this outfall:

<u>DATE OF SAMPLE</u>	<u>5-DAY B.O.D. (PPM)</u>	<u>SOLIDS (PPM)</u>			<u>PHENOL (PPB)</u>	<u>MF COLIFORM COUNT PER 100 ML</u>
		<u>TOTAL</u>	<u>SUSP.</u>	<u>DISS.</u>		
APRIL 8/59	2.4	310	28	282	2.	100,000
JUNE 15/61	3.0	250	19	232	35.	255,000
JUNE 27/61	2.6	262	2	260	2.	13,900

A high phenol content was indicated in samples collected on June 15th.

An official of the Canadian General Electric Company Limited asserted on June 27th, 1961, that to the best of his knowledge, all sanitary wastes at this plant are discharged to the municipal sanitary sewer system. His only explanation of the high coliform content indicated in the process waters is that, since the plant building drain crosses over the process water outfall, a failure of these pipes could result

in sanitary waste entering the process water sewer.

STREAM CONDITIONS WITHIN THE TOWN OF COBOURG

Cobourg Brook

The following laboratory results reveal how the water quality of Cobourg Brook deteriorates as the creek flows through Cobourg:

<u>LOCATION OF SAMPLE</u>	<u>DATE 1961</u>	<u>5-DAY B.O.D. (PPM)</u>	<u>SOLIDS (PPM)</u>			<u>PH</u>	<u>PHENOL (PPB)</u>	<u>CHROME (PPM)</u>	<u>MF COLIFORM COUNT/100 ML</u>
			<u>TOTAL</u>	<u>SUSP.</u>	<u>DISS.</u>				
COBOURG BROOK AT WILLIAM ST.	JUNE 14	1.2	316	44	272	8.1	0	0.08	1,440
COBOURG BROOK AT R.R. BRIDGE	JUNE 14	1.4	308	54	254	8.4	2	0.0	1,600
COBOURG BROOK AT KING ST.	JUNE 27 (JUNE 14)	3.4	326	22	304	7.9	--	0.37	260,000
COBOURG BROOK AT MOUTH	(JUNE 14 (JUNE 27)	BROKEN IN TRANSIT					8.0		22,000 8,900

It is immediately apparent that private and municipal discharges to Cobourg Brook within the Town of Cobourg adversely affect the sanitary chemical and bacteriological qualities of the watercourse in its lower reaches. The phenol content revealed in the creek at its mouth is attributed to contents thereof in the municipal sewage works outfalls and the outfall from the General Wire and Cable plant.

TOWN WATERCOURSE

The following laboratory results reveal that the Town Watercourse receives contaminated discharges and becomes adversely affected in quality as it pursues its southerly course through Cobourg:

<u>LOCATION OF SAMPLE</u>	<u>DATE 1961</u>	<u>5-DAY B.O.D. (PPM)</u>	<u>SOLIDS (PPM)</u>			<u>PHENOL (PPB)</u>	<u>MF COLIFORM COUNT PER 100 ML</u>
			<u>TOTAL SUSP. DISS.</u>	<u>36</u>	<u>324</u>		
TOWN WATERCOURSE AT DIVISION ST. IN NORTHERN SEC- TION OF COBOURG	JUNE 15	1.8	360	36	324	--	320
TOWN WATERCOURSE AT SPENCER ST.	JUNE 15	2.8	370	30	340	--	2,000
TOWN WATERCOURSE AT MOUTH	JUNE 15	1.8	400	42	358	8	43,000

The high coliform content revealed in the Town Watercourse at its mouth may have resulted, in part, from discharges thereto from the municipal storm sewer on King Street (see sampling point #8, Town of Cobourg map) and discharges from the Canadian General Electric Company plant. The presence of a high phenol content in this plant outfall appears to result in an appreciable content thereof in the Town Watercourse.

The presence of a phenol content in Cobourg Brook at its mouth, and in the Town Watercourse where it approaches Lake Ontario, may contribute to the phenol content (3.0 ppb.) revealed in the raw water at the Cobourg water works on June 15th.

SUMMARY

1. The effluent from the Cobourg sewage treatment plant, as well as the overflow from the municipal trunk sanitary sewer at University Avenue, discharges to the waters of Cobourg Brook with significant adverse effects, as revealed by sample results. The presence of industrial wastes is revealed in these flows, and subsequently in the watercourse. The need for remedial action is apparent. Effective chlorination of the sewage treatment plant effluent would assist in reducing the coliform content in the watercourse downstream.

2. Two storm sewers which have their outfall to the harbour were receiving unnecessary overflows from the sanitary sewer system during this survey. Another storm sewer on King Street conducts sanitary waste to the Town Watercourse which is tiled in the downtown section of Cobourg.

3. Two private sewers continue to conduct sanitary waste to watercourses within the town. Officials of the Northumberland-Durham Health Unit staff are aware of these outfalls and have instigated proposals for abating these conditions.

4. Wastes from industrial firms in Cobourg are discharged to watercourses as follows:

General Wire and Cable Limited - industrial and sanitary wastes to Cobourg Brook;

Stuart's Dairy - industrial waste to a branch of Cobourg Brook;

Canadian General Electric Company Limited-process waters and some sanitary waste to the Town Watercourse.

RECOMMENDATIONS

1. The provision of a chlorine contact chamber at the Cobourg sewage treatment plant would assist in reducing the coliform content in the plant effluent. Enforcement of the municipal by-law regulating the quantity and quality of wastes discharged to the sanitary sewers would promote increased efficiencies of the plant treatment processes.

Methods should be adopted to prevent the continual or frequent overflow of untreated sewage to Cobourg Brook from the municipal trunk sanitary sewer at University Avenue.

2. The municipal authorities should ensure that untreated wastes will not escape unnecessarily from the sanitary sewer system to storm sewers and thence to watercourses.

3. The present action of the Northumberland - Durham Health Unit staff in excluding untreated or inadequately treated sanitary waste from private sewers which discharge to watercourses in Cobourg should be continued.

4. Industrial firms in Cobourg should ensure that contaminants will not escape from their premises to watercourses.

RESUME ON SANITARY CONDITIONS
WITH RESPECT TO WATERCOURSES
WITHIN THE TOWNSHIP OF HAMILTON

June 14th, 15th, and 27th,
1961

INTRODUCTION

This report on sanitary conditions in the Township of Hamilton refers only to conditions pertaining to Cobourg Brook and Brook Creek within the municipality. Included, however, is a resume of corrective action obtained since the initial survey was conducted in 1959.

The laboratory results of samples collected from Cobourg Brook within the township are shown in the appended Table I. Also appended is a map of the township. The results of samples taken from Brook Creek are incorporated in the body of this report.

SAMPLING PERTINENT TO COBOURG BROOK

The laboratory results of samples collected from Cobourg Brook within the township during this survey conform with those obtained during the initial survey in 1959. An exception is the high coliform content revealed at sampling point #CBB.5.6 downstream from Baltimore on June 14th, 1961. Sampling at this location was repeated on June 27th, revealing a comparatively low and satisfactory coliform content. The high content indicated on June 14th is attributed to the heavy rainfall which occurred on June 13th and the resulting run-off from land where livestock were pasturing.

SAMPLING PERTINENT TO BROOK CREEK

With the exception of part of its west branch, Brook Creek flows through the township to its mouth at Lake Ontario east of Cobourg. The west branch flows in part through the town and receives the discharge from the 26 Central Ordnance Depot storm sewer. At Highway #2 the creek receives discharges from three storm sewer outlets. The following laboratory results reveal the satisfactory sanitary chemical and bacteriological qualities of flows emanating from two of these storm sewer outlets on June 27th, 1961:

<u>Location of Sample</u>	<u>Sample Point No.</u>	<u>5-Day B.O.D. (ppm)</u>	<u>Solids (ppm)</u>	<u>MF Coliform Count/100 ML</u>
			<u>Total Susp. Diss.</u>	
Storm sewer SE side	20	2.2	588	8 580 1,260
Storm sewer NE side	18	0.9	508	10 498 303

The following laboratory results indicate general satisfactory conditions in Brook Creek during this survey:

<u>LOCATION OF SAMPLE</u>	<u>SAMPLE POINT NO.</u>	<u>DATE OF SAMPLE</u>	<u>5-DAY B.O.D. (PPM)</u>	<u>SOLIDS (PPM)</u>	<u>TURBIDITY (SILICA UNITS)</u>	<u>MF COLIFORM COUNT/100 ML</u>
				<u>TOTAL SUSP. DISS.</u>		
WEST BRANCH OF BROOK CREEK AT COTTESMORE AVE. IN COBOURG	BC.1.1	JUNE 15 JUNE 27	0.8 0.7	348 100	--- 6	--- 184
EAST BRANCH OF BROOK CREEK ABOVE JUNCTION WITH WEST BRANCH	17	JUNE 15 JUNE 27	1.4 1.1	316 326	4 8	312 318
BROOK CREEK AT MOUTH	21	JUNE 15 JUNE 27	2.8 0.9	364 320	30 18	334 302

The high coliform content revealed in the East Branch on June 27 is attributed to run-off entering the creek from the wooded area bordering the creek in this undeveloped area.

INDUSTRIAL OUTFALLS WITHIN THE TOWNSHIP

The firm of P. Leiner and Sons (Canada) Limited operates a gelatine processing plant on the lakeshore approximately one mile east of Cobourg. Process waters from this plant are discharged to Lake Ontario.

An inspection of the industrial waste disposal procedures on these premises was made recently by a member of the Industrial Wastes Branch of this Commission.

Refuse Disposal

During this latter survey, an accumulation of domestic refuse was observed on the east bank of Precious Corners Creek at the diagonal road $\frac{1}{4}$ mile south of Concession Road 2. This wanton method of refuse disposal was drawn to the attention of the local health unit staff.

PRIVATE SEWAGE DISPOSAL

Private septic tank systems are employed in the suburban section of the township lying east of, and adjacent to, the Town of Cobourg.

Reportedly, a new subdivision has been proposed in a presently undeveloped section of the township lying immediately west of Cobourg. If approval for this development should be obtained, town water services may be extended thereto, although private sewage disposal facilities reportedly would be utilized.

Throughout the township, the installation of new septic tank systems is supervised by members of the local health unit staff.

RESUME OF CORRECTIVE MEASURES OBTAINED SINCE THE 1959 SURVEY

Upon the insistence of this Commission, and with co-operation from the health unit staff, Harwood Co-operative Creamery has discontinued the discharging of industrial waste to a local creek flowing to Rice Lake. A septic tank and tile bed system have been provided and receive these wastes. The creamery owner is to be commended for this action.

It ~~was~~ disclosed during the initial survey that partially treated sewage was escaping from the Sidbrook Private Hospital premises, located east of the town corporation limits, and was gaining access to Brook Creek. This condition has been corrected.

SUMMARY

The sanitary chemical and bacteriological qualities of the waters of Cobourg Brook and Brook Creek within the township were generally satisfactory.

No specific recommendations are made at this time.

RIVER SURVEY

BY: R. HICKS
R. BARRENS

WATERCOURSE: COBOURG BROOK

DATE SAMPLED: SEE BELOW

DATE OF SAMPLE 1961	SAMPLE POINT NO.	LAB. NO.	5-DAY B.O.D.	TOTAL	SOLIDS SUSP.	DISS.	PH AT LAB.	SAMPLE TEMP. C	PHENOL IN P.P.B.	CHROMIUM AS CR.	BACTERIOLOGICAL LABORATORY LAB. NO.	M.F. COLIFORM COUNT PER 100 ML.
JUNE 14	CB. 0.0	R-1536	BROKEN IN TRANSIT						8.0	0.16	R-5400	22,000
JUNE 27		5308	5.1	332	34	298	8.4	7.0	7.0	0.16	S-6155	8,900
JUNE 14	CB. 0.4	R-1537	3.4	326	22	304	7.9	—	—	0.37	R-5401	260,000
JUNE 14	CB. 0.6	R-1542	1.4	308	54	254	8.4	2	0.0	0.07	R-5405	1,600
JUNE 27		5307	1.9	260	14	246	8.4	2	0.0	0.07	S-6154	54
JUNE 14	CB. 1.0	R-1545	1.2	316	44	272	8.1	0	0.08	0.08	R-5408	1,440
JUNE 14	CBC. 1.6	R-1547	1.0	350	20	330	—	—	—	—	R-5410	1,230
JUNE 15		4663	1.4	324	18	306	—	—	—	—	R-5383	1,450
JUNE 14	CBCP.5.0	R-1548	1.3	340	36	304	—	—	—	—	R-5411	1,250

CB.0.0 COBOURG BROOK AT LAKE ONTARIO

CB.0.4 COBOURG BROOK AT KING STREET

CB.0.6 COBOURG BROOK AT R.R. BRIDGE

CB.1.0 COBOURG BROOK AT HIGHWAY #2 (WILLIAM STREET)

CBC.1.6 COLDSPRINGS CREEK AT ELGIN STREET.

CBCP.5.0 PRECIOUS CORNERS CREEK AT DIAGONAL ROAD $\frac{1}{4}$ MI. SOUTH OF CON.RD. 2

RIVER SURVEY

Watercourse: Cobourg Brook

By: R. Hicks
R. Barrens

Date Sampled: See below

DATE OF SAMPLE	SAMPLE POINT NO.	LAB. NO.	5-DAY B.O.D.	SOLIDS			BACTERIOLOGICAL LAB. NO.	LABORATORY MF. COLIFORM COUNT PER 100 ML.
				TOTAL	SUSP.	DISS.		

June 14	CBC. 5.0	R-1549	1.0	330	8	322	R-5412	2,700
June 14	CBC. 7.4	R-1550	1.1	318	8	310	R-5413	400
June 14	CB. 1.7	R-1555	1.4	266	10	256	R-5418	520
June 14	CBB. 5.6	R-1552	1.6	274	24	250	R-5415	12,000
June 27		5257	1.0	248	12	236	S-6110	360
June 14	CBB. 6.7	R-1554	1.3	260	16	244	R-5417	580
June 27		5258	1.0	238	12	226	S-6111	340
June 14	CBB. 9.9	R-1553	1.1	256	10	246	R-5416	290
June 14	CB. 5.1	R-1551	1.8	280	24	256	R-5414	700

CBC. 5.0 Coldsprings Creek at Diagonal Road below Con. Rd. 2

CBC. 7.4 Coldsprings Creek at Camborne side-road

CB. 5.1 Cobourg Brook at Con. Rd. 2

CB. 1.7 Cobourg Brook at Division St. and Coldsprings Road

CBB. 5.6 Baltimore Creek at Con. Rd. 2

CBB. 6.7 Baltimore Creek at Diagonal Road below Dam at Baltimore

CBB. 9.9 Baltimore Creek at side-road $\frac{1}{2}$ mi. south of Con. Rd. 5, S. W. of Millvalley

TABLE I-continued

SEWAGE ANALYSIS

Municipality: Town of Cobourg

Source: Municipal Outfalls to Watercourses

By: R. Hicks
R. Barrens

Date Sampled: See below

Date of Sample	Lab. No.	5-Day B.O.D.	Solids			pH at Lab.	Chromium as Cr	Phenol in PPB	Bacteriological Examination	
			Total	Susp.	Diss.				Lab. No.	MF. Coliform Count per 100 ML.
June 14	R-1539	8.0	758	16	742	7.9	0.6	4	R-5403	62,000
June 27	5306	59.0	1054	158	896	8.5	2.30	60	S-6153	590,000
June 14	R-1538	640.	6690	1504	5186	12.3	33.	—	R-5402	120
June 15	4870	0.6	908	8	900	—	—	—	R-5388	440
June 15	4868	210.	1500	310	1190	—	—	—	R-5386	17,000,000
June 15	4869	115.	618	126	492	—	—	—	R-5387	41,100,000
June 15	4871	23.	928	92	836	—	—	—	R-5389	1,020,000
June 15	4862	1.0	680	2	678	—	—	—	R-5380	165

R-1539 CB 0.5T Effluent from Cobourg S.T.P. - to Cobourg Brook

5306

R-1538 CB.0.5R Sanitary trunk sewer overflow to Cobourg Brook at University Ave.

4870 1- Storm sewer to Harbour- Manhole at Orr St. and Hibernia St.

4868 2- Storm sewer to Harbour- Manhole at Third St. & Albert St.

4869 4- Storm sewer on Division St. discharging to Harbour- sampled at manhole- corner of Division St. and Albert St.

4871 8- Storm sewer on King St. discharging to Town Watercourse- sampled at manhole- King St. West of Division St.-north side

4862 7- Storm sewer at foot of Abbott Blvd. - to Lake Ontario

TABLE II

SEWAGE ANALYSIS

Municipality: Town of Cobourg

Source: Industrial Outfalls

By: R. Hicks
R. Barrens

Date Sampled: See below

Date of Sample 1961	Lab No.	5-Day B.O.D.	Solids			pH at Lab.	Phenol in PPB.	Bacteriological Examination		
			Total	Susp.	Diss.			Lab.	MF. Coliform No.	Count per 100 ML.
June 14	R-1544	0.7	312	18	294	—		R-5407		42
June 15	4872	7.0	758	162	596			R-5390		23,000
June 15	4873	135.	364	28	336		6.	R-5391		2,780,000
June 27	5256	1.6	258	24	234		0.	S-6109		126,000
June 15	4864	190.	624	156	468			R-5382		8,000
June 15	4875	3.0	250	18	232		35.	R-5393		255,000
June 27	5255	2.6	262	2	260		2	S-6108		13,900

TABLE III

4
 R-1544 CB.07 I Drain from General Foods Ltd. to Cobourg Brook
 4872 CB.0.9P Sewage discharge from General Wire and Cable to Brook
 4873 CB.0.9I Process water and sewage outlet from General Wire and Cable - to Brook
 5256
 4864 CBC.2.1I Outfall from Stuart's Dairy to Coldsprings Branch
 4875 (13) Outfall from C.G.E. to Town Watercourse
 5255

S E W A G E A N A L Y S I S

Municipality: Town of Cobourg

Source: Private Outfalls

By: R. Hicks
R. Barrens

Date Sampled: See below

Date of Sample 1961	Lab. No.	5-Day B.O.D.	Solids			pH at Lab.	Turbidity in Silica Units	Bacteriological Examination		
			Total	Susp.	Diss.			Lab. No.	Mf. Coliform	Count per 100 ML.
June 14	R-1543	300.	2296	256	2040	—	—	R-5406	284,000	AI
June 14	R-1546	0.9	1310	116	1194	—	—	R-5409	124,000	ELBERT
June 15	4880	1.2	542	—	—	—	1	R-5398	7,000	AI
June 27	5251	1.1	508	2	506	—	—	S-6104	5,500	AI

R-1543 CB.0.5 P Private sewer to Cobourg Brook at University Avenue Bridge

R-1546 CBC.1.6 P Private discharge to Coldsprings Branch at Elgin St. - South-west side

4880 16 Ordnance Depot storm sewer outfall to Brook Creek
5251



LEGEND

GE. 0.3
SAMPLING POINT SHOWING STREAM AND MILEAGE
STREAM AND MILEAGE AT OUTFALL
TYPE OF OUTFALL

GE. 0.4
OUTFALL

D. OPEN DRAIN OR DITCH

DI. DRAIN OR DITCH WITH INDUSTRIAL POLLUTION

TOWNSHIP OF
HAMILTON
SCALE: 1 INCH = 40 CHS.

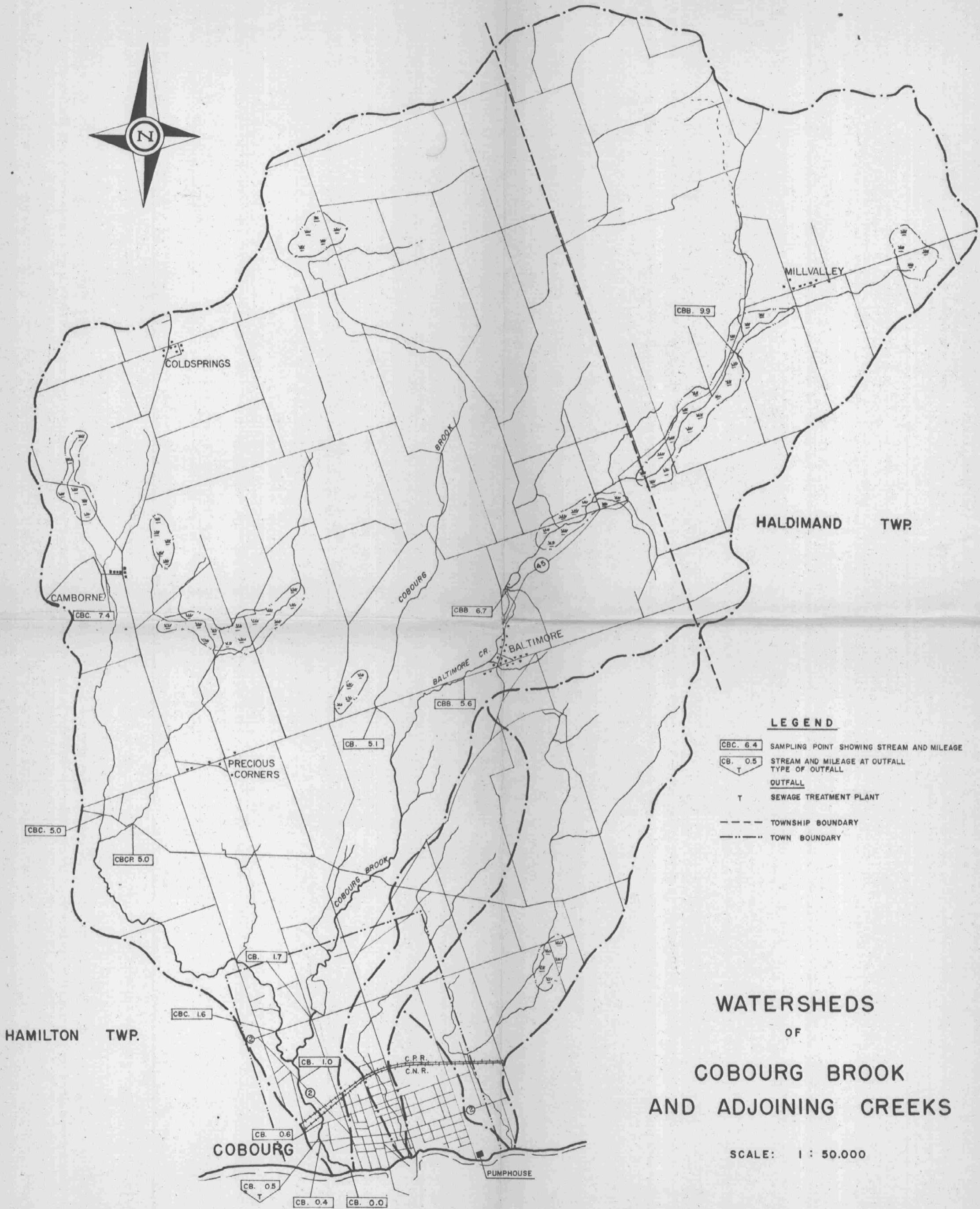


TOWN OF COBOURG

MUNICIPAL SANITARY SURVEY

1959-61

0 250 500 1000 2000 3000
SCALE: 1 INCH = 500 FT.



LEGEND

CBC. 6.4	SAMPLING POINT SHOWING STREAM AND MILEAGE
CB. 0.5	STREAM AND MILEAGE AT OUTFALL
T	TYPE OF OUTFALL
OUTFALL	
T	SEWAGE TREATMENT PLANT
—	TOWNSHIP BOUNDARY
—	TOWN BOUNDARY

**WATERSHEDS
OF
COBOURG BROOK
AND ADJOINING CREEKS**

SCALE: 1 : 50,000

LABORATORY LIBRARY



96936000118522

MOE/COB/WAT/ASOH
Barrens, R.G.
Report on water
pollution survey of asoh
Cobourg Brook c.1 a aa

Map



Environment Ontario

Laboratory Library
125 Resources Rd.
Etobicoke, Ontario M8P 3VF
Canada